Claims

1. Coated tool, in particular for machining, having a substrate, which has a predetermined coefficient of thermal expansion, a first carbon layer which is deposited on the substrate, which has a predetermined highly predominant fraction of carbon with a diamond crystal structure and a coefficient of thermal expansion which is smaller than the coefficient of thermal expansion of the substrate and at least one second carbon layer (B), which is deposited further outside with reference to the substrate (M) than the first carbon layer (A), and in the case of which the fraction of carbon with a diamond crystal structure is highly predominant but lower than the predetermined fraction of carbon with a crystal diamond structure in the first carbon layer (A), and in the case of which the coefficient of thermal expansion is greater than the coefficient of thermal expansion of the first carbon layer (A), characterized in that the second carbon layer includes nano-crystalline diamond.

2. Tool according to Claim 1, characterized in that the second carbon layer (B) consists of nano-crystalline diamond.

3. Tool according to Claim 1 or 2, characterized in that the second carbon layer (B) is deposited directly on the first carbon layer (A).

4. Tool according to Claim 1 or 2, characterized in that formed between the first carbon layer (A) and the second carbon layer (B) is an interlayer in the case of which the fraction of carbon with a diamond crystal structure drops continuously from the first carbon

layer (A) in the direction of the second carbon layer (B).

5. Tool according to one of Claims 1 to 4, characterized in that it has an overall thickness of the first carbon layer (A) and the second carbon layer (B) in the range from 1 to 40 µm.

6. Tool according to Claim 5, characterized in that it has an overall thickness of the first carbon layer (A) and the second carbon layer (B) in the range of 4 to 20 µm.

7. Tool according to Claim 6, characterized in that an overall thickness of the first carbon layer (A) and of the second carbon layer (B) in the range of 6 to 15 µm is formed.

8. Tool according to one of Claims 1 to 7, characterized in that the second carbon layer (B) has a minimum thickness of 0.5 µm.

9. Tool according to one of Claims 8, characterized in that further material layers are arranged between the first carbon layer and the second carbon layer.

10. Tool according to one of Claims 1 to 9, characterized in that with reference to the substrate beyond the second carbon layer further material layers are arranged.

11. Process for producing a tool substrate which is coated with carbon and has a predetermined coefficient of thermal expansion, having the following steps:

a) depositing onto the tool substrate (M) a first

carbon layer (A), the process conditions being selected such that the carbon layer (A) contains a predetermined highly predominant fraction of carbon with a diamond crystal structure and has a smaller coefficient of thermal expansion than the tool substrate (M); and

b) depositing a second carbon layer (B), which lies further outside with reference to the substrate (M) than the first carbon layer (A), the process conditions being selected in such a way that by contrast with the predetermined fraction of carbon with a diamond crystal structure of the first carbon layer (A) the second carbon layer (B) has a highly predominant but reduced proportion of carbon with a diamond crystal structure and a larger coefficient of thermal expansion than the first carbon layer (A).

12. Process according to Claim 10, in which in step a) the process conditions are selected such that the first carbon layer (A) has a high as possible a fraction of carbon with diamond crystal structure.

13. Process according to Claim 11 or 12, in which in step b) the process conditions of step a) are changed to reduce the fraction of carbon with a diamond crystal structure by comparison with the first carbon layer (A).